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**Author:** John H. Dilks III, K2TQN

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# OLD RADIO

## Old Radio Profile: The Mystique Of The HRO-500—Only The Dial Remains The Same.

Contributed by Al Klase, N3FRQ

Many of us remember the introduction of National Radio Company's HRO-500 general-coverage communication receiver in late 1964. If we discount the consumer-oriented Heathkit GC-1A Mohican, the HRO-500 was probably the first full-featured all-solid-state communications receiver. This was a revolutionary step in a succession of National HRO receivers dating back to 1934.

By the early 1950s and the introduction of SSB operation, the nearly legendary HRO design was clearly obsolete by amateur standards. However, the double-conversion HRO-60 had soldiered on into the 1960's as a commercial "laboratory-reference" receiver due to its wide frequency range and stable performance.

While few amateurs actually got to use HRO-500s, everyone knew about them. Their \$1500 price tag was intimidating. (In 1964 you could almost buy a complete Collins S-line station or a modest automobile for \$1500!) Despite the price, the wide frequency coverage and solid performance of the HRO-500s carved a substantial niche in the commercial and military market. Over the years a fair number of these sets have made their way out of the laboratories, maritime installations, and military supply depots and into the hands of mere mortals. Through the vintage-radio collecting hobby we're finally able to own and appreciate treasures of this sort.

The HRO-500's frequency range extends from 30 MHz all the way down to 5 kHz with the optional LF-10 low-frequency preselector. The first conversion oscillator is controlled by a phase locked loop referenced to a single 500-kHz crystal, and provides a level of frequency accuracy and stability unparalleled in earlier HROs. The overall frequency range is divided into 60 500-kHz frequency bands tuned by the distinctive HRO knob, which controls the tunable IF. This control covers the 500 kHz range in five turns with 1-kHz accuracy. The center knob offers an additional 5:1 reduction ratio for easy SSB tuning.

While the 230-kHz LC filters in the final IF do not have the extremely steep skirts we've come to expect from crystal or mechanical filters, their 2.5:1 shape factor is adequate for all but the worst band conditions. Additionally, the LC design



The legendary HRO-500 receiver.

allows the passband of the 2.5 kHz and 500 Hz filters to be tuned continuously to either side of the crystal controlled BFO frequency. The 5 kHz and 8 kHz AM filters are fixed. A highly effective tunable notch filter is available in all modes.

While normally powered by an internal 115/230-V ac power supply, this receiver may be operated from a 12-V dc external source. A front panel switch turns off the dial lights, holding current consumption to a mere 200 mA (about enough to power the heater in one decent vacuum tube). A NiCd battery pack was available as an option.

On the air the HRO-500 gives a good account of itself even in the late twentieth century. Tuning is smooth and accurate. Selectivity is very good, and the passband tuning and notch filter let you dodge serious QRM. The set has a proper product detector and automatic gain control for good SSB performance. The 5- and 8-kHz

AM filters provide the proper bandwidth for almost any occasion. The vintage solid-state circuitry is somewhat prone to overload on really strong signals, but the **AGC THRESHOLD** knob controls a highly effective front-end attenuator.

Tune-up does require some operating skill. The **BAND MC** switch selects one of five broad frequency bands. The appropriate 500-kHz band segment is selected by turning the **SYNTHESIZER TUNE** control until the desired frequency appears in the synthesizer-tune window and the red **PHASE LOCK** lamp stops flashing. Then the **PRESELECT TUNE** control is set to the approximate frequency and the station is selected with the main tuning knob. Finally, the preselector should be touched up using the S meter.

After all these years, it certainly is nice to lay a hand (and an ear) on one of these fine instruments. If the opportunity presents itself, take it!

For additional HRO-500 information on the Web, visit: <http://www.eht.com/oldradio/arrrl/index.html>

## SEE YOU AT RADIO XXXI!

I am planning to attend RADIO XXXI, a large vintage radio show at the Westford Regency Inn in Westford, Massachusetts (I-495 at Exit 32) on Sunday February 20, 2000. The show opens at 8 AM. It attracts sellers who display early home radios, microphones, Morse keys, crystal sets, books, magazines, and a few vintage Amateur Radio sets. It is a good place to collect. If you can attend, look for my call letters on my hat and say hello!—K2TQN

QST

## Collector Profile: Al Klase, N3FRQ

Al is a vintage radio collector, restorer and historian specializing in communication receivers. As Al tells it, "At the tender age of about three, I got a look inside my grand-father's 1930 McMillan radio—a gigantic wooden box filled with glowing vacuum tubes, and other mysterious objects. I've been in electronics ever since." General tinkering, engineering school, the US Army Signal Corps and many years as an electronics design engineer helped him further this early interest.

In a world where one can hide a quarter-billion transistors under a fingertip, Al finds working on vintage gear a welcome change from his work as a field applications engineer for a major semiconductor company. He has also done extensive investigations on the technical aspects of crystal radios, and feels the deceptive simplicity of crystal sets is an interesting counterpoint to the complexities of the high-end shortwave sets.

Al is presently program chairman for the New Jersey Antique Radio Club and newsletter editor for the Delaware Valley Historic Radio Club. Al has been licensed as N3FRQ since 1987.

